

Physical Therapy Rehabilitation for a Patient with Complex Regional Pain Syndrome: A Case Report

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Abstract

Case Information: Interdisciplinary rehabilitation gathered for a 26-year-old female suffering from Complex regional pain syndrome (CRPS) and interventions been used. An interdisciplinary team including various specialties performed complementary roles to assist with the patient's rehabilitation.

Team goals C treatment plans: Weekly meetings were held by the interdisciplinary team to properly manage rehabilitative care from various disciplines. The psychiatry team in internal medicine monitored medication administration and overall development. Physical therapy addressed upright tolerance, transfer, gait, and strength training using Luna EMG machine and Erigo machine. Occupational therapy focused on showering/dressing activities.

Psychology assisted with coping strategies. Nursing was responsible for monitoring nutritional intake and medication compliance, while physiatry dealt with muscle hyper-tone and introduced anti-spasticity medications.

Discussion: One month and 17 days post-admission the patient's progress allowed her to reach her main goal of transfer and ambulation using quad cane at the right hand. The patient developed sever right foot pain symptoms were resolved by physiatry team. With the help of an occupational therapist, the patient achieved complete independence in both upper and lower body dressing and bathing, as well as in transferring from bed to a wheelchair. Gait with quad cane at the right hand was possible to reach more than 20 meters. 2 weeks of using the Luna EMG machine and Erigo machine show improvement in upright standing and transfer bed to wheelchair or chair.

Conclusion: When rehabilitation team members from various specialties collaborate within the framework of an ongoing updated comprehensive management plan, they can fulfill synergistic roles and achieve such great results following one month and 17 days, showing how the Luna EMG machine and Erigo machine play the main role from physiotherapist point of view in such case, but I still insist to keep digging for more examination as possible systemic errors could not be avoided during new technology device like the Luna EMG machine and Erigo machine.

Keywords

Complex Regional Pain Syndrome; Physical Therapy; Rehabilitation care; Interdisciplinary team; Occupational therapy; Rehabilitation; Reflex Sympathetic Dystrophy.

Abbreviations

CRPS: complex regional pain syndrome **RSD:** reflex sympathetic dystrophy

PT: physical therapy

CPM: continuous progressive motion **OT:** occupational therapy

ROM: range of motion

FIMs: functional independence measures **MMT:** manual muscle test

JPS: Joint position sense

Introduction

Rehabilitative care programs for patients with Complex regional pain syndrome (CRPS) expect multi-specialties coordination to direct the common presence of multiple overlapping conditions [1]. This case described interdisciplinary care for a patient with CRPS resulting in sever right foot pain limiting patient's function, post right big toenail removal. The patient was being cared for by an interdisciplinary team consisting of primary care, physical therapy, and other specialties such as Internal Medicine, occupational therapy, physiatry, therapeutic recreation, assistive technology, registered dietician and nursing at a rehabilitation hospital [2].

CRPS is a broad term that covers long-lasting pain and inflammation that can happen after an injury or a medical event, such as surgery, trauma, stroke or heart attack. It can occur anywhere in the body, it usually affects a person's arm, leg, hand or foot [3]. Beyond pain, CRPS with represents other clinical symptoms including changes in skin temperature, skin color and texture, sweat, abnormal nail and hair growth and Impaired muscle strength and movement [4,5]. Allodynia (pain from normally non-painful stimuli) was also commonly reported [6]. Pharmacotherapy was the main tool in the rehabilitation and management of patients with complicated neurological conditions [7], often an insufficient pain management strategy brings up the persistence and unresponsiveness of neuropathic pain symptoms, due to the presence of numerous underlying pain mechanisms, and the limitations of available pain control medications.

Case Presentation

Clinical history

A 26-year-old female medically free, symptoms started around the age of 13 after right big toenailremoval, CRPS affected the right foot, symptoms consisted of pain, swelling, redness and unvoluntary jerky movements. Pain was alleviated by taking medications. Went into multiple intervention which are Lumbar sympathectomy, steroid injections, nerve block and finally spinal surgery to insert spinal cord stimulator for pain control in June 2023. She was admitted to a local hospital in Riyadh, Saudi Arabia approximately 3 months following her spinal surgery, which resulted in reduced pain during rest. Then the patient was transferred to an acute rehabilitation facility for nearly 7 weeks.

Assessment

The patient was diagnosed with Sever CRPS affecting mainly the Right foot. Initial evaluation of the body was normal. The patient was cognitively intact and able to interact normally with hospital staff. Right foot pain left the patient with a very minor ability to move independently, requiring assistance for most movements such as turning in bed.

Functional limitations, including extremity weakness, being wheelchair dependent with poor standing balance, affected proprioception in the right foot, and orthostatic hypotension, were factors of residual tissue damage and edema from the CRPS. The patient wore ted stocking daily. She had anxiety, depression and low appetite.

Initial Plan of Care

The nurse practitioner and internist ordered medication and served on the interdisciplinary care team. Occupational therapy (OT) management concentrate on improving upper limb power and showering/dressing activities. Education about strategies and the importance of developing self-functional skills were additionally incorporated into one-hour sessions five days a week. The physical therapy (PT) program included physical and educational training on transferability from the wheelchair to\from bed. Gradual weight bearing tolerance practice was also used with help of the Erigo machine to accomplish the dual goals of standing fully upright to facilitate upright rehabilitation activities without signs/symptoms of orthostatic hypotension [8]. The physical therapy program contained approximately 1-hour sessions, twice a day, 5 days per week besides focusing on major muscles group in hips, knees, and ankles at both sides by using bed exercise and Luna EMG machine. The patient met once monthly with

psychology professionals who were providing counseling to help the patient cope with the effects of CRPS [9].

Implementation of Intervention (Treatment course)

The patient underwent a rehabilitation program aimed at improving lower limb mobility, strength, and gait with Luna EMG machine therapy focusing mainly on the right lower limb. The program incorporated a variety of modalities delivered over nearly a 7-week period, which are:

1. Continuous passive motion (CPM): The Luna EMG machine was used to deliver CPM therapy to the patient's right hip, knee, and ankle.
2. Joint position sense (JPS) training: The Luna EMG machine was used to provide JPS training.
3. Weight-lifting exercises: The Luna EMG machine was used to assist with weight-lifting exercises, gradually increasing strength in the right hip, knee, and ankle musculature.

Additional Therapeutic Interventions

Erigo device training: The patient underwent training with the Erigo machine to promote correct gait pattern. This device is a robotic tilting table that provides supported upright positioning incorporated with exercises

Strengthening exercises: A program of traditional strengthening exercises for the lower limbs using lightweight cuffs and TheraBand.

Ambulation and gait training: Gait training was implemented to improve the patient's gait pattern and balance. This included practicing with parallel bars and wheeled walker frame under close supervision.

MOTomed machine: MOTomed therapy was used to provide passive or active-assisted movement to the lower limbs.

Myofascial release: Targeting the quadriceps, hip abductor, adductors, triceps surae and tibialis anterior muscles.

Achieved Rehabilitation Goals

After approximately 1 month and 17 days of rehabilitative care which included a program of traditional strengthening exercises for the lower limbs using lightweight cuffs and TheraBand 1-3 Kg (kilogram), Luna EMG and Erigo machine were used alternatively daily from 3rd week until discharge and MOTomed machine 1st to 3rd, then patient was able to stand fully using walker frame with no assistance and gradually reached ambulation using quad cane at the left hand which was the main goal by the last week. Also, she was able to perform complete transfer by herself from bed to wheelchair. The patient had right foot tremor due to that 20 mg of Baclofen was prescribed to lessen the abnormal movement and relieve stiffness [10]. Since the patient preferred a less invasive intervention and given that an increase in lower-leg muscle tone provides the necessary stability during gait, baclofen was prescribed instead of botulinum toxin. Given that botulinum toxin reduces muscle tone to a flaccid form, it could affect mobility.

Four weeks following Baclofen administration, right foot tremor was reduced significantly. Physical and occupational therapies modified their rehabilitation focus toward achieving functional independence. Pain was controlled by hydromorphone and fentanyl transdermal patch.

Discussion

CRPS is a broad term that covers long-lasting pain and inflammation, in this case chronic CRPS means that the mobility level is very limited, with reduced or absent muscle strength in the extremities, affected sensation and proprioception had resumed motor and sensory skills back all due to a major reason which is multiple disciplines that run appropriate care and rehabilitation for 1 month and 17 days from an interdisciplinary team.

This case demonstrates rehabilitation as a performer within an interdisciplinary team and my job as Physiotherapist where the Luna EMG and Erigo machines were the main interventions and most effective tools where they demonstrated efficacy through repeated applications to the patients. Also, they were used while closely monitoring patients to ensure they achieved the goals set by the team. Management planning took place to address issues through regular patient status discussions, specialty-specific goal-setting, and rehabilitation benchmark-setting. These informal plans were then recorded on a computer system. Both official and unofficial coordination occurred during the weekly interdisciplinary team meetings and the regular daily interactions between each of the providers. By avoiding redundant and unnecessary care and creating a synergistically positive therapeutic effect, coordination within interdisciplinary management emphasizes and supports the care of other providers within a team, thereby enhancing the benefits for the patient and his family members.

Little research has been conducted to elucidate the specific benefits of the Luna EMG and Erigo machine for persons suffering from CRPS. In this particular case, care was given to maximize everyday activities and functional abilities. The patient took benefits of psychology and psychiatric resources and therapies to facilitate coping strategies, support well-being, and process concerns related to managing the physical challenges and needs resulting from her injury. On this interdisciplinary team, each discipline specialist demonstrated that they had participated in patient education, kept track of and documented observations regarding the patient's emotional state, and supported the goals set by others. To support this level of care coordination, every facility that belongs to a health organization must be able to facilitate the interdisciplinary process outlined in this article.

A well-functioning Luna EMG and Erigo machines is present potential effects on the goals and strategies of the patient, other team providers, and the overall rehabilitation plan had worked so well too. I presented here, members of each professional group worked collaboratively to support and/or facilitate the care of other team members by adapting methods to avoid redundant therapies and enlist the evaluation and/or treatment of needed specialties. Luna EMG and Erigo machine were one of the choices in my opinion had made the impossible become possible for the patient's functional abilities and made her reach her goals of ambulation using quad cane on the left side.

Conclusion

This case describes the rehabilitation management of a patient suffering from CRPS by an interdisciplinary team. When rehabilitation team members from various specialties collaborate within the framework of a consistently updated comprehensive management plan, they can fulfill synergistic roles and achieve such great outcomes following 1 month and 17 days show how Luna EMG and Erigo machine played the main role from physiotherapist point of view in such case but I still insist to keep digging for more examination as possible systemic errors could not be avoided during new technology device like Luna EMG and Erigo machines.

References

1. Harden RN, McCabe CS, Goebel A, Massey M, Suvar T, et al. (2022) Complex regional pain syndrome: Practical diagnostic and treatment guidelines, 5th Edition. *Pain Med.* 23(Suppl1):S1-53.
2. Momsen AM, Rasmussen JO, Nielsen CV, Iversen MD, Lund H. (2012) Multidisciplinary team care in rehabilitation: an overview of reviews. *J Rehabil Med.* 44(11):901-12.
3. U.S. Department of Health and Human Services.(2020). Complex regional pain syndrome. National Institute of Neurological Disorders and Stroke.
4. Shim H, Rose J, Halle S, Shekane P. (2019) Complex regional pain syndrome: a narrative review for the practising clinician. *Br J Anaesth: BJA* 123(2):e424–33.
5. Eldufani J, Elahmer N, Blaise G. (2020) A medical mystery of complex regional pain syndrome. *Heliyon.* 6(2): e03329.
6. Taylor SS, Noor N, Urits I, Paladini A, Sadhu MS, (2021) Complex Regional Pain Syndrome: A Comprehensive Review. *Pain* 10(2):875-92.
7. Gilron I, Bailey JM, Holden RR, Weaver DF, Houlden RL (2005) Morphine, gabapentin, or their combination for neuropathic pain. *N Engl J Med.* (13):1324-34.
8. Kumar, S., Yadav, R., C Aafreen (2020). Comparison between Erigo tilt-table exercise and conventional physiotherapy exercises in acute stroke patients: a randomized trial. *Arch physiother.* 10:3.
9. Lee DH, Noh EC, Kim YC, Hwang JY, Kim SN, et al. (2013) Risk factors for suicidal ideation among patients with complex regional pain syndrome. *Psychiatry investigation.* (1):32-38.
10. Mangnu TJP, Bharwani KD, Dirckx M, Huygen F J P. (2022) From a Symptom- Based to a Mechanism-Based Pharmacotherapeutic Treatment in Complex Regional Pain Syndrome. *Drugs*,82(5):511–531.
11. Backonja MM. (2012) Neuropathic pain therapy: from bench to bedside. *Semin Neurol.* 32(3):264 -8.
12. Schmidt SG. (2016) Recognizing potential barriers to setting and achieving effective rehabilitation goals for patients with persistent pain. *Physiother Theory Pract* (5):415-26